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EXAMINER	
GRAHAM, ANDREW R	
ART UNIT	**PAPER NUMBER**
2644	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/796,199	HUGHES ET AL.	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The applicant's response, received 9/26/05, taken in view of the amended claims, have been fully considered, but are not persuasive, as is further detailed below in response to the arguments presented in said response.

On page 10, lines 10-28, the applicant has noted that Oyaba teaches dividing or the "division" of the frequency range to be reproduced, specifically stating "Applicant's invention as recited in Claims 1-2, 14-15, and 17-19 does not divide the sound at a division frequency into different ranges which are reproduced through a corresponding pair of speakers. Instead, in Applicant's invention as claimed, each subsequent pair of drivers or transducers reproduces a subset of the frequency band associated with the first pair of drivers or transducers". In related remarks, the applicant then summarizes that "Oyaba neither teaches nor suggests subsequent pairs of drivers reproducing a subset of the frequency band associated with a first pair of drivers". The examiner respectfully disagrees, noting that the pertinent claim language, as amended, does not preclude the teachings of Oyaba from anticipating said language and limitations. Specifically, the conceptual "dividing" of the reproduced frequency range as taught by Oyaba does not provide a mutual or explicit correlation to the frequency ranges reproduced by the first pair of drivers and the second pair of drivers. Rather, the nature of the implementation of such a division frequency must be considered. Oyaba

implements this divided frequency range through the use of high and low pass filters. As is well-known in the art, the cutoff frequency of a filter does not attenuate entirely the frequencies beyond said cutoff frequency, but rather attenuates said extended frequencies by an increasing amount. Such a concept is evidenced by both the specification of the present application (see, for example, page 8, lines 2-5) as well as the teachings of Oyaba. Specifically in Oyaba, the signal applied to the speakers equated in the rejection to the "first" pair of drivers has a 6 dB attenuation at the division frequency f_c and a 18 dB attenuation at $f_c/2$ (col. 2, lines 56-63). The signal applied to the speakers equated in the rejection to the "subsequent" pair of drivers also has a 6 dB attenuation at the division frequency and a 18 dB attenuation at $2*f_c$ (col. 2, lines 48-53). For the first pair of drivers, the frequencies above f_c, such as between f_c and $2*f_c$, are applied to the speakers from the high pass filter with an implicit attenuation of between 6 and 0 dB by virtue of the definition of a "high pass" filter and the standard filter characteristics associated therewith. As noted above, the speakers of Oyaba equated to the "subsequent" pair of drivers receives a signal that at least comprises these same frequencies, fc to 2fc, even though said frequencies are attenuated. Such attenuation does not preclude these frequencies, though they are diminished in amplitude, from being "reproduced" as presently claimed. The fact that these frequencies, as attenuated, are yet reproduced by the respective speakers is evidenced by the equations in Oyaba which define the resultant sound

pressure at a location remote from the speakers and are based in part upon the respective gains of the filters (col. 3, line 1 - col. 4, line 30). Thus, the "subsequent" pair of drivers in Oyaba yet "reproduces a subset of the first frequency band", such as at least the frequencies f_c and $2*f_c$, wherein the "first frequency band" is the frequency band output by the first pair drivers that comprises at least the frequencies greater than $f_c/2$. As such, the teachings of Oyaba yet anticipate the claimed invention, as applied below.

On page 11, lines 16-18 and 21, the applicant has stated, "Although the Examiner has alleged that there would have been motivation to combine the references, the Examiner has overlooked the fact that Oyaba is directed to a speaker system, whereas Flanagan is directed to a microphone", adding "Microphones and speakers are not analogous art". The examiner respectfully submits that the applicant has overlooked column 6, lines 61-63 of Flanagan, which directly refutes the first statement cited above and further evidences the notion that, as is well-known in the art, microphones and speakers are fundamentally analogous art.

On page 12, lines 3-5, the applicant has stated, "both Oyaba and Steuben use cross-over networks to divide the frequencies presented to each driver, rather than presenting subsequent drivers with subsets of the frequencies presented to a first driver or set of drivers". The examiner respectfully notes that, similar to the above discussion in regards to Oyaba, crossover networks commonly share at least a subset

of mutually passed frequencies, even if said passed frequencies are passed with an applied degree or amount of attenuation.

On page 12, lines 10-19, the applicant notes the rejections of Claims 10, 12, and 13, though no further arguments particular to the rejection of these claims are concurrently noted. As the rejections of the parent claims have been addressed and maintained in light of the response to arguments listed above, the rejections of these claims have also been reviewed and are respectively maintained herein, as is listed below.

Claim Rejections - 35 USC § 112

2. The amendments made to **Claims 3, 5-6, and 17-18** in view of the previous grounds of rejection under 35 U.S.C. 112 2nd paragraph suffice to overcome said previous grounds of rejection. Accordingly, said grounds are hereby withdrawn.

Drawings

3. Receipt of the new drawing is hereby acknowledged. The content of said drawing suffices to overcome the previous grounds of objection to said drawings. Accordingly, said objection to the drawings is hereby withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-2, 14-15, and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by Oyaba et al (USPN 4991687)(hereafter, "Oyaba").

Oyaba teaches a directional speaker system that comprises a line of paired speakers with particular operating frequencies and respective spacings.

Specifically regarding **Claim 1**, Oyaba teaches:

A loudspeaker system (Figure 1) having a line array of drivers (L_l, H_l, H_r, L_r) comprising:

a first pair of drivers (H_l, H_r)(col. 2, lines 56-59);

a center point (crossing of "central axis" and direction of relative 90°) along the line array (col. 5, lines 5-9);

wherein the pair of drivers are substantially centered about the center point (implicit, "center" axis as noted above, Figure 1) with a center to center distance of d_0 (d_2 in Oyaba) between the first pair of drivers (H_l, H_r)(col. 2, lines 56-59; col. 5, lines 35-42)

wherein the pair of drivers reproduce a first frequency band (at least comprising $f_c/2$, f_c, and $>f_c$, by virtue of the definition of a high pass filter, col. 2, lines 59-63); and

at least a subsequent pair of drivers (L_l,L_r) arranged in the line array with the first pair of drivers (straight line, col. 1, lines 10-14, Figure 1) and substantially centered about the center point (crossing of "central axis" and 90° direction, Figure 1; col. 2, lines 45-55),

wherein the subsequent pair of drivers (L_l,L_r) are spaced such that the center to center distance between each at least a subsequent pair of drivers, dn (d_1 in Oyaba),

is equal to $4nd_o$ ($4*n*d_1$ in Oyaba), where n = 0 at the innermost pair of drivers and n increases by 1 for each at least a subsequent pair of drivers (col. 2, lines 56-59, $d_2 = d_1/4$ equates to $4*1*d_2=d_1$, wherein Figure 1 meets the case of n=1 in the claimed formula "$4nd_o$"),

and wherein the at least a subsequent pair of drivers reproduce a subset of the first frequency band (speakers Ll,Lr at least reproduce f_c, which teaches a "subset" as claimed, even if said frequency is attenuated, it is still 'reproduced' as generally recited in the claim language; subset may also be interpreted as $f_c/2$ to f_c, which would also be passed by the low pass filter, at least by definition of a low pass filter, col. 2, lines 45-53).

Regarding **Claim 2**, Oyaba discloses:

The loudspeaker system of claim 1, further comprising a low pass filter on every pair of drivers for n > 0 (L_l,L_r are supplied signals through a low pass filter, col. 2, lines 45-53).

Regarding **Claim 14**, Oyaba discloses:

A method for optimizing a radiation pattern (more than 20 dB attenuation in direction of 90° relative to central axis) of drivers (H_l,H_r,L_l,L_r) in a line on a loudspeaker (Figures 1 and 2, col. 4, lines 12-29),

the method comprising the steps of:

selecting a spacing, d_0 (d_2 in Oyaba), between the centers of a pair of innermost drivers (H_l,H_r) according to the formula

$d_0 = c/2f$

wherein c is the speed of sound and f is the maximum desired operational frequency (f_2 is upper frequency of two octaves over which narrow directivity is obtained, col. 4, lines 45-48; d_2 is spacing between high frequency range speakers, col. 2, lines 56-59; high frequency speakers output f_2, col. 2, lines 59-63; λ_c is wavelength corresponding to f_c, or $f_c*\lambda_c=c$, where c is speed of sound, inherent relationship between wavelength and frequency, in view of col. 2, line 55; $f_2=2f_c$ and $d_2=d_1/4= \lambda_c/4$, col. 3, lines 61-62; solving $f_c*\lambda_c=c$ for f_2 and d_2, $(f_2/2)*(4*d_2)=c$, which equates to $d_2=c/2f_2$) and

wherein the pair of innermost drivers reproduce a first frequency band (at least comprising $f_c/2$, f_c, and $>f_c$, by virtue of the definition of a high pass filter, col. 2, lines 59-63);

selecting a center point in the line (intersection of central axis, line to P_0, with line to P_{90}), wherein the center point is the same position on the line as $d_0/2$ (by definition, center or central axis, col. 4, lines 12-15); and

determining the spacing of at least one additional pairs of drivers (L_l,L_r) in the line (Figure 1)(col. 2, lines 45-48)

wherein each driver of the additional pair of drivers is added to the outermost positions of the line (Figure 1),

wherein the distance, d_n (d_1 in Oyaba), between the centers of the additional drivers is according to the formula

$d_n = 4nd_0$ ($d_2 = d_1/4$ or $d1=4d_2$, wherein n=1, col. 3, lines 61-62)

where n = 0 at the innermost pair of drivers and n increases by 1 with each pair of drivers sequentially added along the array (case in Figure 1 represents situation where n=1) and wherein the at least one additional pair of drivers reproduce a subset of the first frequency band (speakers Ll,Lr at least reproduce f_c, which teaches a "subset" as claimed, even if said frequency is attenuated, it is still 'reproduced' as generally recited in the claim language; subset may also be interpreted as $f_c/2$ to f_c, which would also be passed by the low pass filter, at least by definition of a low pass filter, col. 2, lines 45-53).

Regarding **Claim 15**, Oyaba discloses:

the pairs of drivers (at least Ll,Lr) are used in conjunction with low pass filtering (col. 2, lines 47-53).

Regarding **Claim 19**, Oyaba discloses:

the maximum desired operational frequency is substantially the highest frequency without high amplitude side lobes (f_2 is upper frequency of range over which narrow directivity is obtained, which comprises not affecting peak values in directivity pattern, Figure 2, as compared to Figure 4, col. 1, lines 35-38, col. 4, lines 39-48; also, f_2 and d_2 meet formula of Claim 14, thus properties associated with such a formula are met by f_2 and d_2; specification page 7, lines 3-8 state that such spacing establishes uppermost frequency to which the array will reduce high amplitude side lobes)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 3, 5-7, and 17-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyaba as applied above, in further view of Flanagan (USPN 4653606).

As detailed above, Oyaba teaches a directional speaker system that comprises a line of paired speakers with particular operating frequencies and respective spacings.

Regarding **Claim 3**, Oyaba discloses that the outer pair of speakers L_l,L_r) is low pass filtered, and that additional outer

transducers may be added to increase the operational frequency range (col. 4, lines 45-56), which reads on "n>1", but does not specify:

the low pass filter has a different corner frequency for each pair of drivers.

Flanagan teaches a transducer system with a directional response.

Specifically regarding Claim 3, Flanagan teaches:

the low pass filter has a different corner frequency for each pair of drivers (col. 4, lines 56-68; col. 5, lines 1-23; col. 6, lines 14-23 and 61-63)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement an low pass filters on the additional drivers of Oyaba with a cutoff frequency lower than that of the inner or middle drivers as is taught by Flanagan. The motivation behind such a modification would have been that decreasing the size of the array as the frequency of the transduced sound increases would have minimized beamwidth variations over the desired frequency range.

Regarding **Claim 5**, Oyaba in view of Flanagan at least suggests:

the corner frequency, f_n of the low pass filter is equal to $2c/d_n$, where c is the speed of sound (Flanagan teaches association of upper cutoff frequency with individual speakers, col. 4, line 45 - col. 5, line 23; col. 8, lines 36-45; frequencies higher than c/d, wherein the overall distance between a pair of speakers is 2*N*d, lead to spatial aliasing, col. 4, lines 7-11 and 26-30; this highest limit frequency is thus f=c/d, but putting d of Flanagan into the same terms as the

'd' of the claimed equation, $d_{(Flanagan)}=1/2\ d_{(claim)}$, and therefore the higher limit is f=2c/d, in the variables as defined in the claim; implementing this value as the higher frequency limit for a pair of transducers is taught or at least suggested by the teachings of Flanagan, further considering the use of pairs of speakers for a particular frequency ranges in the system of Oyaba; the desirability for such an implementation is thus that it would have removed the higher frequencies of a particularly spaced pair that otherwise that lead to aliasing in the array output, as is taught by Flanagan)

Regarding **Claim 6**, Oyaba discloses:

the low pass filter on the outermost pair of drivers in the array has a corner frequency calculated by $f_n = c/d_n$ for the outermost pair of drivers (the lpf of Oyaba has a -12 dB decrease over one octave, col. 2, lines 48-53; inferring a -12 dB slope, as is present in the filter of Flanagan, col. 5, lines 8-10, a filter with a -6dB point at f_c and a -12 dB slope would have a -3dB or cutoff point at $7/8*f_c$; the corresponding wavelength for this cutoff $\lambda_{cutoff}=c/(7/8*f_c))= 8/7*c(f_c)$; setting $c=f_c*\lambda_c$ in $\lambda_{cutoff}=8/7*c(f_c)$, $\lambda_{cutoff}=8/7*(f_c*\lambda_c)(f_c)=8/7*\lambda_c$; as $8/7*\lambda_c$ is between λ_c and $3/2*\ \lambda_c$, which are the permitted ranges for d_1 (col. 5, line 40), the teachings of Oyaba anticipate a corner frequency calculated by $f_n = c/d_n$, wherein $f_n = 7/8*f_c$ and $d_n = 8/7*\lambda_c$)

Regarding **Claim 7**, Flanagan discloses:

a driver (322) centered on the center point of the line array (col. 4, lines 62-65, Figure 2).

Regarding Claims **17 and 18**, please refer above to the grounds of rejection cited and relied upon in the rejection of the similar limitations of Claims 5 and 6, respectively.

6. **Claims 4, 8, 9, 11, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyaba as applied above, and in further view of Steuben (USPN 5359664).

As detailed above, Oyaba teaches a directional speaker system that comprises a line of paired speakers with particular operating frequencies and respective spacings.

Regarding **Claim 4**, Oyaba discloses that the outer pair of speakers L_l,L_r) is low pass filtered, but does not specify:

- that each low pass filter is of first order

However, various combinations of components are known in the art for deriving crossover networks, as is evidenced by the teachings of Steuben.

Regarding **Claim 4**, Steuben discloses:

- each low pass filter (130, in view of LPF of Oyaba) is of first order (col. 6, lines 1-2, 35-57)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the low pass filter of Oyaba as a first order, in-line low pass filter as disclosed by Steuben. The motivation behind such a modification would have been that such the impedance and bandwidth for the passed low frequency range would have been better controlled, as compared to conventional

implementations. Such a filter use would have also eliminated the need for an additional high pass filter for the upper frequency speakers of Oyaba, creating a more efficient network.

Regarding **Claim 8**, please refer above to the rejection of the similar limitations of Claims 1 and 4.

Regarding **Claim 9**, Oyaba teaches:

at least a third pair of transducers arranged in the array with the first pair of transducers and n increases by 1 for each pair of transducers, whereby n = 0 for the first pair of transducers, n = 1 for the second pair of transducers, and n = 2 for the third pair of transducers ("additional speakers", col. 4, lines 45-56; col. 5, lines 43-46)

Oyaba does not clearly specify "having a distance, d_n, between the center points of the transducers in the at least a third pair of transducers, wherein the midpoint of d_0 is the same midpoint of d_n; and wherein the distance, dn, is equal to $4nd_n$

However, Oyaba teaches that the relative distance between a pair of drivers may vary from 2 to 4 (col. 5, lines 35-42). Applying such a variable range to the spacing of another pair of additional speakers, specifically a relative spacing of "2" would have read on a respective $4nd_n$ spacing. The motivation for such a particular combination of the teachings of Oyaba would have been that it may well have exhibited a better directivity characteristic.

Regarding **Claim 11**, please refer above to the rejection of the similar limitations of Claims 1 and 4.

Regarding **Claim 16**, please refer above to the rejection of the similar limitations of Claim 4.

7. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Oyaba in view of Steuben as applied above, and in further view of DeVries (6128395).

As detailed above, Oyaba teaches a directional speaker system that comprises a line of paired speakers with particular operating frequencies and respective spacings. Steuben teaches a first order crossover filter.

As is evidenced by the teachings of Oyaba, and is known in the art, the spacing between the inner drivers controls the maximum operational frequency (col. 3, lines 38-60; col. 4, lines 45-48).

However, Oyaba in view of Flanagan does not clearly specify:

- d0 is 1.2 inches, d1 is 4.8 inches, and d2 is 9.6 inches.

DeVries teaches a directional speaker system.

Regarding **Claim 10**, DeVries discloses:

d0 is 1.2 inches, d1 is 4.8 inches, and d2 is 9.6 inches (DeVries teaches a directional frequency up to about 10 Khz, which equates to a spacing of 1.2 inches, col. 1, lines 34-37; the relevant other teachings of spacing per Oyaba read on the spacings of 4.8 inches and 9.6 inches, as discussed above in regards to Claims 1, 5, and 9).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement a directional frequency band of up to about 10KHz, resulting in the claimed spacings, for the

system of Oyaba in view of Flanagan, as is taught by DeVries. The motivation behind such a modification would have been that such a frequency range would have given the system a range adequate for many audio applications.

8. Claims 12 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oyaba in view of Steuben as applied above, and in further view of Flanagan.

As detailed above, Oyaba teaches a directional speaker system that comprises a line of paired speakers with particular operating frequencies and respective spacings. Steuben teaches a first order crossover filter, comprising "a low pass filter of first order", as detailed above.

Oyaba in view of Steuben does not clearly specify:

- a low pass filter on the at least a third pair of transducers.

Flanagan teaches a transducer system with a directional response.

Specifically regarding Claim 12, Flanagan teaches:

a low pass filter on the at least a third pair of transducers (col. 4, lines 56-68; col. 5, lines 1-23; col. , lines 14-16 and 61-63)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement an low pass filters on the additional drivers of Oyaba in view of Steuben with a cutoff frequency lower than that of the inner or middle drivers as is taught by Flanagan. The motivation behind such a modification would have

been that decreasing the size of the array as the frequency of the transduced sound increases would have minimized beamwidth variations over the desired frequency range.

Regarding **Claim 13**, Flanagan discloses:

the outermost pair of transducers in the array has the lowest frequency low pass filter (col. 6, lines 14-16).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chinn can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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